

# Metacontingencies, Cultural Selection and Social/Verbal Environment

## Metacontingencias, Selección Cultural y Ambiente Social/Verbal

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### Resumen

En las últimas décadas, Sigrid Glenn, a partir de la proposición del concepto de 'metacontingencia', ha desarrollado una propuesta analítico-conductual que busca ampliar el tratamiento skinneriano de los procesos de selección/evolución cultural. Este artículo presenta inicialmente una descripción del desarrollo conceptual de esta propuesta. A continuación, teniendo en cuenta la importancia que se le ha asignado a repertorios verbales en el proceso de selección cultural, se presentan las propuestas de los antropólogos Terrence Deacon y Marvis Harris que abordan la relación entre la evolución de ambientes sociales/verbales y la selección/evolución de prácticas culturales. Por último, basándose en estas propuestas, se discuten formas en que el control de la conducta individual por el grupo - y sus agencias de control - sugieren un creciente desarrollo de mecanismos de control verbal/social, lo que indica la importancia de fomentar el estudio de las relaciones entre la evolución de ambientes sociales/verbales y la selección/evolución de prácticas culturales.

*Palabras clave:* Metacontingencia, selección cultural, prácticas sociales/verbales.

### Abstract

In the last decades, Sigrid Glenn, from the proposition of the concept of 'metacontingency', has developed a behavioral-analytic proposal that seeks to amplify the Skinnerian treatment given to cultural selection/evolution processes. This paper initially presents a description of the conceptual development of this proposal. Afterwards, considering the importance that has been assigned to verbal repertoire in the cultural selection process, proposals from anthropologists Terrence Deacon and Marvis Harris, who approach the relationship between the evolution of social/verbal environments and the selection/evolution of cultural practices, are presented. Finally, based on these propositions, forms in which the control of individual behavior by the group – and by their controlling agencies – seems to denote an increasing development in verbal/social control mechanisms are discussed, indicating the importance to go more deeply into the study of relationships between the evolution of social/verbal environments and the selection/evolution of cultural practices.

*Keywords:* Metacontingency, cultural selection, social/verbal practices.

Very early in his line of thought, Skinner (1953/2005) indicates that human behavior is determined by variables operating in three levels, phylogeny, ontogeny and culture. In these three levels, consequences affecting variations, respectively, on the species, on the individual's behavior and on culture practices, selecting different products. This proposition of causal analysis was systemized in the *model of selection by consequences* (Skinner, 1981).

The way that selection by consequences acts on phylogeny and ontogeny was discussed by Skinner (e.g., 1938/1992) in details, and the focus on ontogeny produced a large diversity of empirical and conceptual research in the context of the Experimental Analysis of Behavior and Applied Behavior Analysis (for some examples, see Catania, 1998). On the other hand, the cultural level of selection was not so thoroughly analyzed and did not generate a significant density of empirical research.

This discrepancy could have been a consequence of the manner in which Skinner defined culture and how cultural selection/evolution could be studied:

A culture can be defined as contingencies of social reinforcement maintained by a group. As such, it evolves in its way, as new cultural practices ... contribute to the survival of the group and are perpetuated because they do so. The evolution of cultures is no further relevant here because no new behavioral processes are involved (Skinner, 1984, p. 221; see also Skinner, 1961/1972).

In the past decades, Sigrid Glenn, from the proposition of the concept of *metacontingency*, has developed a behavioral analytical proposal that seeks to amplify the Skinnerian treatment given to cultural selection/evolution processes (e.g., Glenn, 1986, 1988, 1991, 2003, 2004, 2008). This paper initially presents a description of this proposal. Afterwards, considering the importance that has been assigned to verbal repertoire in the cultural selection process (e.g., Baum, 1995; Glenn, 1987, 1989, 1991; Houtmanfar & Rodrigues, 2006; Malott, 1988), proposals from anthropologists Terrence Deacon and Marvis Harris who approach the relationship between the evolution of social/verbal environments and the selection/evolution of cultural practices are presented (Deacon, 1997; 2010; Harris, 1974, 1979/2001). Finally, based on these propositions, forms in which control of individual behavior by the group

– and by their controlling agencies – seems to denote an increasing development in verbal/social control mechanisms are discussed, indicating the importance go more deeply into the study of relationships between the evolution of social/verbal environments and the selection/evolution of cultural practices.

### Selection/evolution of cultural practices: The notion of Metacontingencies

A cultural practice can be defined as part of the behavioral repertoire of an individual which is replicated in the repertoire of other individuals in a cultural context (Andery, Micheletto, & Sérgio, 2005). In this manner, cultural practices cannot be comprehended apart from the social context of its occurrence. In other words, when it is possible to observe behavioral patterns being replicated and learned by several members of a same group, it can be called a cultural practice of that particular group. When someone says, for example, that, in a same group, several people listen frequently to the music of J. S. Bach, listening to such music could be described as a cultural practice of that group of people.

This definition is similar to what Glenn (2003) describes as *culture-behavioral lineages*, which are operant lineages that are replicated in the repertoire of other participants of a same group. Thus, they differ from operant lineages, since these are part of an individual organism and cease to exist when the organism dies. Cultural-behavioral lineages are supraorganismic, and can be observed in other members of a same group when the original organism dies. Furthermore, Glenn (2003) also describes *cultural lineages* as more complex phenomena. Whereas culture-behavioral lineages account for operant behavior being replicated among individuals, cultural lineages describe the continuing recurrences of interactions patterns between two or more individuals which produce different outcomes than individual behavior. From these definitions, and from the model of selection by consequences as a causal model of behavior, it is concluded that an analytical tool for the selection of cultural practices needs to focus (a) the behavior of several individuals, one related to the others, (b) events that occur as consequences of this group practice and (c) how this consequence affects the group.

Although Skinner (1981) points out that selection at the cultural level acts not upon individuals, but on *cultural*

*practices*, no unit of analysis of this “third kind of selection” (p. 502) is described at that moment. Actually, Skinner’s (1981) assertion is basically that selection on a cultural level of analysis is a product of “special contingencies maintained by an evolved social environment” (p. 502). The need for a unit of analysis of selection at the cultural level leads to the formulation of the concept of the *metacontingency* by Glenn (1986). As pointed out by Glenn (1986), a metacontingency is a “unit of analysis describing the functional relations between a class of operants, each operant having its own immediate, unique consequence and a long term consequence common to all operants in the metacontingency” (p. 2). Thus, the concept of the metacontingency describes the relations between patterns of interlocking behavioral contingencies (IBCs) – when two or more organisms respond in relation to one another – and the consequences produced by such interlocks. The concept was later refined in Glenn (1988, 1991, 2003, 2004), with an increasing focus on the recurrence of IBCs and the recognition that the common consequence can also be immediate. Therefore, the concept of metacontingency is used to refer evolving lineages of IBCs that function as an integrated unit and which results in an aggregated outcome, which, in turn, alters the probability of future recurrence of the interlocks (Glenn, 2004). It should also be highlighted that metacontingencies do not control the behavior of individuals, but the contingencies that control such behavior. The concept of metacontingency has contributed to a treatment of cultural phenomena under a behavioral-analytic standpoint without being necessary to call upon theoretical constructions of other fields (Todorov, 2006).

In a posterior elaboration of the concept, Glenn and Malott (2004) claim that, in organizations, metacontingencies are composed of three components: interlocked behavioral contingencies (IBCs), their aggregated product and their receiving system. This last component acts as a “recipient of the aggregate product and thus functions as the selecting environment of the interlocked behavioral contingencies” (Glenn & Malott, p. 100). According to the authors, it is the receiving system which provides the consequences which select or not the IBCs. In a later proposition, Glenn (2008) calls the receiving system by the term of *cultural consequence*, approximating an earlier denomination of the consequence which selects cultural practices (cf. Glenn, 2003). The cultural consequence acts upon the relationship between IBCs and aggregated products, and selects such relationship.

In a critique elaborated by Houmanfar and Rodrigues (2006), it is pointed out that, if parallels are made between the contingency of reinforcement and the metacontingency, the last lacks and antecedent element which could set the occasion for the occurrence of cultural practices. In the contingency of reinforcement, “the first term, the antecedent is an environmental variable that occasions the second term, the response” (p. 23). Thus, to maintain the parallel with the contingency of reinforcement, an antecedent element must be included in the metacontingency. Such element is identified by the authors as the cultural milieu of beliefs, social organization, material resources, governmental policies, traditions, verbal behavior, among others. The cultural milieu establishes an occasion in which an environmental consequence would be available when a group of individuals produced an aggregated product through their coordinated behavior. Note that, when analyzing human cultures, most of the examples above regarding cultural milieu are embedded with verbal behavior. The exception may be material resources, although when talking about the administration of material resources – economy – humans also rely on verbal behavior.

When evaluating the relationships between contingencies and metacontingencies in human cultures, Glenn (1986) points out that a fundamental role is exercised by behavioral repertoires denominated as verbal behavior. The author classifies verbal behavior as the necessary “glue” to maintain the interlock of behaviors of two or more individuals and the consequences produces by such interaction (Glenn, 1991). Other authors (e.g., Baum, 1995; Malott, 1988) also have highlighted verbal behavior as indispensable to the study of cultural evolution.

### Social/verbal environment and selection/evolution of cultural practices

When addressing verbal environment, a social environment is necessarily focused. As pointed by Guerin (2001), the foundations of “language” are social. All that can be affected by verbal behavior are other people, that is, the social environment. Thus the evolution of verbal and social environments is strictly related. Nevertheless, and even though there is recognition of the role that verbal repertoire can have on cultural selective processes, the relationship between selection/evolution of cultural practices and the social/verbal environments in which they are constituted has not been thoroughly analyzed in a behavioral-analytic perspective.

Two anthropologists, Terrence William Deacon (1950-) and Marvis Harris (1927-2001) presented proposals on the relationship between the evolution of social/verbal environments and selection/evolution of cultural practices that can provide subsidies to a behavioral-analytic treatment of cultural level of selection.

### **Terrence William Deacon: *The Co-evolution of Language and Brain***

Deacon (1997) discusses the co-evolution of social and verbal environments. According to the author, changes in how primitive humans formed groups possibly originated the development of symbolic relations, which, on the other hand, gave support to group cohesion. An example given by the author involves the means to obtain food used by primitive humans, initially a hunter-gatherer mode of production. Such production mode required some organization of the small social groups. Hunting activities were predominantly conducted by the males of the groups. The females did execute hunting activities due to periods of pregnancy and child care. In this social configuration, where the males of the groups were absent during hunting periods, females, despite the gathering source of food, still required a animal protein source to secure more energy and health for her and her offspring. Sexual exclusivity both guaranteed insurance for the females' survival and descendents for the male. Deacon (1997) points out that several social mechanisms could have evolved to guarantee such exclusivity, with these mechanisms being embedded with primitive symbolic relations. The establishment of symbolic relations could have emerged together with the need to maintain a certain organization within the group. The creation of male-female bonds favored survival of offspring, facilitated labor division among genders, which led to optimized acquaintanceship and, ultimately, survival. Furthermore, this increase in behavioral complexity could have supported an increase in neural interactions that undermine verbal functions, thus implying in co-evolution of phylogenetic aspects, as well as behavioral and cultural ones (Deacon, 2010). Such development of social strategies being associated to human cognitive development has also been pointed out by Fisher (1983).

In the previous example, it is possible to observe that changes in non-verbal repertoire altered the environment so that more refined verbal repertoire was selected. In both cases it is possible to say that IBCs which lead to a

consequence affecting the whole group, in this case, survival of the group through a more efficient food production.

Thus, verbal responses which exercised control over the behavior of other group members, contributing to a more cohesive social organization, possibly acquired verbal operant functions (they could work, for example, as *tacts* and *mands*, according to the taxonomy presented by Skinner, 1957/1992). Such socially mediated responses would allow more successful food production and control over the behavior of other members of the group, regarding the formation of family groups. The moment, in which such repertoires began being taught to younger members of the group, a cultural selection process is observed.

Such example seems to be in accordance to the assertion made by Glenn (1989), who points out that the role of verbal behavior in the evolution of cultures must have evolved in function of contingencies that gave support to non-verbal behavior. The author emphasizes that the origin of a verbal community – verbal environment – lies in contingencies of natural selections and contingencies of reinforcement responsible for non-verbal behavior. Such verbal community provides the survival of a group to the point that it gives support to non-verbal behavior that favors the survival of sufficient individuals to maintain the contingencies of reinforcement maintaining such survival practices. It means that verbal environment only evolves if it supplies the means that gives support to the evolution of the social environment, favoring the transmission of verbal practices that support to such evolution.

### **Marvin Harris' Cultural Materialism**

Another example of a possible analysis of complex cultural practices through metacontingency relations and verbal analysis can be taken from the descriptions of cultural materialist anthropologist Marvin Harris. (Approximations between Harris' theoretical proposals and Behavior Analysis have been long discussed by behavior analysts. For more information, see Andery & Sérgio, 1999; Glenn, 1988; Harris, 2007; Lloyd, 1985; Malott, 1988; Vargas, 1985). For instance, when describing the taboo on pork by Jews and Muslims, Harris (1974) points to the fact that the cultural groups have origins in early nomad groups from the Middle-East. That region is widely dominated by arid climate and lands that are no appropriate to pluvial agriculture. Due to difficult irrigation of the terrain, domestic ruminant



animals, such as cattle or goats are better adapted. This animals' primary nutrition is based on grass and leaves. Pigs, on the other hand, are better adapted to woodlands and river banks. Their primary nutrition is composed of food with low cellulose content, such as fruits and cereals, which makes them potential nutrition competitor with humans. The pig also is not a milk source, contrary to cows and goats. Their initial domestication was due to their abundant source of meat but, however, after a large scale demographic growth in the region between 7000 and 2000 B.C., pork became a luxury.

In the previous analysis, the pork taboo seems to be related to resource regulation tool of those groups. In such context, verbal responses, which could be mainly characterized in terms of the verbal operant of mind (Skinner, 1957/1992), exercised an important role in regulating the population's eating habits. It is possible that such verbal practices gave birth to religious dogmas characteristic of the two cultural groups pointed out above, being instructed to younger members, both by commoners as by the emergence of controlling agencies (cf. Skinner, 1953/2005) of religious nature.

A particular characteristic of Harris' (1974) analysis involves the maintenance of social/verbal practices even in a modified environment. Initially, it is possible to identify that the establishment of social/verbal repertoire that characterize the taboo presents a clear relationship to the natural environment. Thus, individual repertoires maintained by the verbal community are related to a specific cultural milieu – agricultural conditions of the Middle-East – that results in both organizational and material benefits for the group. However, the pork taboo is maintained until the present day, even in radically modified environments – use of modern irrigation techniques – or completely different environments – the presence the Jewish and Muslim cultural groups in other regions of the world. These verbal communities still train similar verbal repertoire to their own. The resulting cultural consequence does not seem to involve material benefits, only social consequences for the group (the possible “ethnic unity”) or even consequences of maintaining the status quo of sub-groups within that culture. This last explanation characterizes what Glenn (1986) called *ceremonial cultural practices*, which are those practices maintained not for material benefits or group survival, but by maintain the dominating social status or particular individual(s) of the group.

It is noteworthy that Harris' analysis, instead of drawing on the verbal reports of natives of a particular culture as the primary data, analyzes production and reproduction components of a society, with focus on the relationship that the particular group maintains with both the environment (Harris, 1979/2001). But analyzing environmental variables that affect the cultural practices of a group, a researcher can avoid that myths or other supernatural arguments are taken on account as explanations for the occurrence of these practices, when their simply another cultural (social/verbal) of the group.

Although Harris (1979/2001) removes the verbal interactions from the primary focus of analysis, it is widely assumed that only with the advent of verbal behavior the level of complexity of human cultures became possible. As pointed out in a review made by Glenn (1988), it is estimated that, initially, cooperative non-verbal behaviors were selected in hunter-gatherer communities, because they would result in greater food production. Verbal behavior which coordinated and gave support to such cooperation must have resulted in an even more efficient food production, gradually leading to an evolution of the verbal environment, and consequently, of the cultural practice.

## Final considerations

The two points of view presented above (Deacon's and Harris') are shown as possible contributions to a behavioral analysis of culture. While Harris' analysis has been more extensively looked upon by behavior analyst, including an extensive comment by Harris (2007) on approximations between the fields, the work of Deacon has not been widely explored in the behavior-analytic community. Furthermore, several other points of view on cultural analysis could possibly lead to a productive discussion with a behavioral analytic standpoint on culture, such as the one presented by Diamond (2005) or from the evolutionary psychology paradigm (e.g., Dunbar, Knight & Power, 1999). The first has been conducted by Sampaio (2008) and Dittrich (2008) and the second still needs elaboration, but these analyses would stand alone in another text.

In accordance to the analysis of the characterizations of the proposals of Sigrid Glenn, Terrence Deacon and Marvin Harris, one of the points of extreme importance of the social/verbal environments to cultural evolution lies in

the transmission of cultural practices. Verbal reports, either oral or written, allow that a new generation has access to the advances produced by previous generations without having to repeat all the same steps. Traditional school education is an example of how people learn by reading and discussing knowledge produced in past generations. Mainly, students have access to written verbal behavior of other people they never met. As noticed by Baum (1995), rules of a culture are an important part of their practices, and their understanding will not be complete without taking into account their place and origin in the culture, just as other practices.

As observed in the examples given by Deacon (1997) and Harris (1974), besides the role in cultural transmission, events dispersed in time can exercise control over behavior and, in many cases, allow self-control repertoires that favor consequences in the long run with grater magnitude for the group over immediate consequences for the individual. Such type of self-control, which exercises an important role in cultural evolution, is known in literature as ethical self-management (Skinner, 1968/2003).

In fact, as pointed by Skinner (1987), the instruction of new generations by means of verbal control over behavior elevated human cultures to a new level, leading to ever more complex behavioral relations. Thus, instructions (contingency descriptions) characterize important events in the control of human behavior in contemporary cultures (cf. Baum, 1995; Glenn, 1987, 1989; Malott, 1988). On the other hand, some behavioral repertoire instructed to new generations become increasingly distant from the contingencies in which they emerged. In this manner, such cultural practices are not maintained necessarily through their relations and effects on the natural environment, but are under control of social/verbal variables (cf. Skinner, 1953/2005, 1987).

Therefore, the transference of control over a cultural practice seems to tag along the development and increase in complexity of the social/verbal environment. Countless daily cultural practices of contemporary human life are not controlled by the natural environment. Control of the individual's behavior by the group – and by its controlling agencies – seems to denote an increasing development in verbal/social control mechanisms, since individual behavior, initially under control by direct consequences, become maintained by means of emergent social/verbal

practices in the culture (Deacon, 1997; Harris, 1974). This disconnection between cultural practices and their effects on the natural environment mark one of the characteristics of the complexity of modern western cultures. (Skinner, 1987).

Bringing together this analysis with the one conducted by Houmanfar and Rodrigues (2006), by focusing the analysis of modern cultures, part of the exercised control over cultural practices seems to be found in what the authors described as cultural milieu, which is mostly composed of verbal behavior. Laws, moral and ethical values and educational practices of a culture are all constructed on the verbal environment, exercising a stronger control over human behavior and on the natural environment. Thus, the study of cultural evolution becomes inseparable of the study of verbal behavior.

As noticed by Andery and Sérgio (1999) when discussing some aspects of the study on metacontingencies, “it is necessary to roll up the sleeves and study verbal behavior, despite the difficulties and precariousness of our instruments – conceptual and methodological” (p. 115). More precisely, studies that dig deep in understanding the relationships between verbal behavior and cultural selection are needed, leading to a greater comprehension of the third level of selection by consequences. Also, as pointed out by Guerin (2003), since the very foundations of language are social, a complete comprehensive on the study subject cannot be done without observing “the social, economic, historical and cultural contexts” (p. 251) in which it is evolved. Some few empirical studies investigating the function of verbal repertoire in cultural transmission, using laboratory microculture (or microcommunity) methods (e.g., Baum, Richerson, Efferson & Paciotti, 2004; Leite, 2009; Oda, 2009) began this type of research. It is expected that this paper stimulates the development of new investigations on the relationships between the evolution of social/verbal environments and cultural selective processes.

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